

ABSTRACT OF THE DISCLOSURE

A telemetric tibial tray includes a lower plate that defines a plurality of cylindrical transducer cavities having circular load diaphragms. An upper plate is attached to the lower plate through support posts projecting from the load diaphragms. The support posts have a circular cross-section and a diameter of about 5.0 mm. The lower plate further defines wiring channels communicating between the transducer cavities and a central cavity housing the circuit board for the telemetric tray. The wiring channels are arranged at a 45 degree angle relative to the sagittal plane of the knee joint in order to reduce the effects of the wiring channel intersection on the strain sensitivity of the tray. Each transducer cavity includes a radial strain gage array with four pairs of radially aligned strain gages, each pair aligned at a 45 degree angle relative to the sagittal plane of the knee joint. Each pair of strain gages includes an inner gage positioned at the point of maximum positive micro-strain across the diaphragm when loaded, and an outer gage positioned at the point of maximum negative micro-strain, to thereby increase the differential strain measured by the gages and increase the strain sensitivity of the tibial tray.